

Applicant     .:     Scott C. Glasgow et al.  
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In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1-19. (Canceled)

20. (Currently Amended)     ~~The energy management tube defined in claim 1, wherein~~ An energy management tube adapted to reliably and predictably absorb substantial impact energy when impacted longitudinally, comprising:

a first tube section;

a second tube section aligned with the first tube section; and

an intermediate tube section with first and second end portions integrally connecting the first and second tube sections, respectively; the first and second tube sections being dimensionally different in size and the intermediate tube section having a shape transitioning from the first tube section to the second tube section;

the first tube section being larger in size than the second tube section and including an outer surface defining a tubular boundary, the first end portion including a continuous band of deformed material flared outward radially beyond the outer surface and which acts to support and maintain a columnar strength of the first tube section upon longitudinal impact, the second end portion contrastingly being configured to initiate a telescoping rolling of the second tube section during impact as the first tube section maintains its columnar strength;

wherein the first tube section has a yield strength of at least about 10% greater than the second tube section.

21. (Currently Amended)     ~~The energy management tube defined in claim 1, wherein~~ An energy management tube adapted to reliably and predictably absorb substantial impact energy when impacted longitudinally, comprising:

a first tube section;

a second tube section aligned with the first tube section; and

an intermediate tube section with first and second end portions integrally connecting the first and second tube sections, respectively; the first and second tube sections being dimensionally different in size and the intermediate tube section having a shape transitioning from the first tube section to the second tube section;

the first tube section being larger in size than the second tube section and including an outer surface defining a tubular boundary, the first end portion including a continuous band of deformed material flared outward radially beyond the outer surface and which acts to support and maintain a columnar strength of the first tube section upon longitudinal impact, the second end portion contrastingly being configured to initiate a telescoping rolling of the second tube section during impact as the first tube section maintains its columnar strength;

wherein the first end portion has a radius of not less than about 0.5 times a wall thickness of the first tube section.

22. (Original) The energy management tube defined in claim 21, wherein the second end portion has a second radius of more than about 1.0 times a wall thickness of the second tube section.

23-43. (Canceled)

44. (Original) An energy management tube adapted to reliably and predictably absorb substantial impact energy when impacted longitudinally, comprising:

a first tube section;

a second tube section aligned with the first tube section; and

an intermediate tube section with first and second end portions integrally connecting the first and second tube sections, respectively; the first tube section being larger in size than the second tube section, and the intermediate tube section having a shape transitioning from the first tube section to the second tube section; and

the intermediate tube section and one of the first and second tube sections being annealed to have different material properties than the other of the first and second tube

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sections, the different material properties including a change in yield and elongation properties and being adapted to facilitate deformation and shaping of the intermediate tube section upon the intermediate tube section receiving stress sufficient to deform the intermediate tube section.

45. (Original) The energy management tube defined in claim 44, wherein the different material properties include increased elongation and lower yield properties adapted to support predictable and desired telescoping roll of the annealed one tube section during a longitudinal impact.

46. (Original) The energy management tube defined in claim 45, wherein the different material properties include increased elongation and lower yield properties adapted to support mechanically forming the one tube section, including changing a cross section of the one tube section to be different in size.

47. (Original) The energy management tube defined in claim 45, wherein the different material properties include increased elongation and lower yield properties adapted to support up-setting the intermediate tube section to a shape promoting rolling of material during a longitudinal impact.

48-72. (Canceled)

73. (Currently Amended) ~~The energy management tube defined in claim 64, wherein~~ An energy management tube adapted to reliably and predictably absorb substantial impact energy when impacted longitudinally comprising:

a first tube section having a first resistance to deformation;

a second tube section having a second resistance to deformation, the second resistance to deformation being greater than the first resistance to deformation; and

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an intermediate tube section connecting the first tube section to the second tube section;

whereby, upon undergoing a longitudinal impact, the intermediate tube section and the first tube section roll predictably and sooner than the second tube section upon the intermediate tube section receiving forces from the longitudinal impact;

wherein the second tube section is heat-treated, thereby making the second resistance to deformation greater than the first resistance to deformation.

74. (Previously Presented) The energy management tube defined in claim 73, wherein the intermediate tube section is heat treated.

75. (Previously Presented) The energy management tube defined in claim 74, wherein the second tube section and the intermediate tube section are annealed.

76-77. (Canceled)